March 30, 1954 O. PLYM 2,673,543

CONNECTING DEVICE FOR ATTACHING BOOMS TO MASTS

Filed March 16, 1951

2 Sheets-Sheet 1

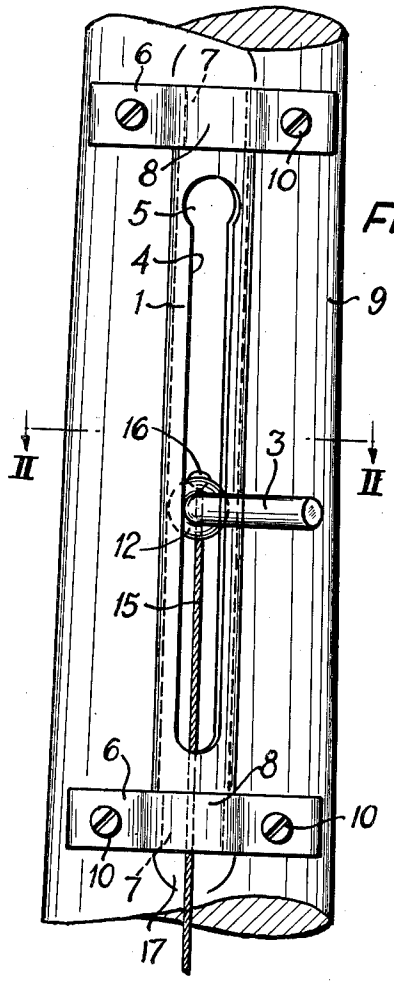


FIG. 1

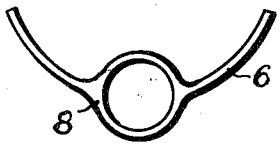


FIG. 3

FIG. 2

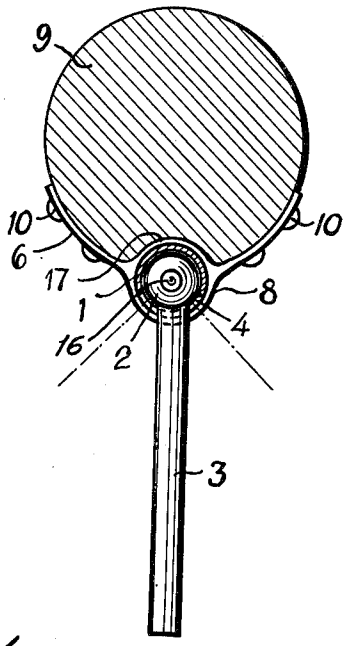


FIG. 5

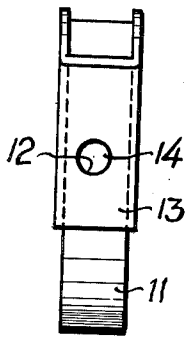
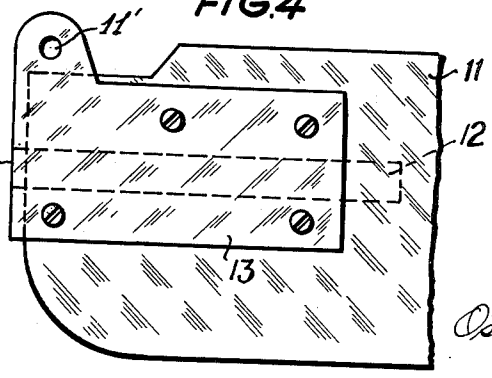


FIG. 4



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2 Sheets-Sheet 2

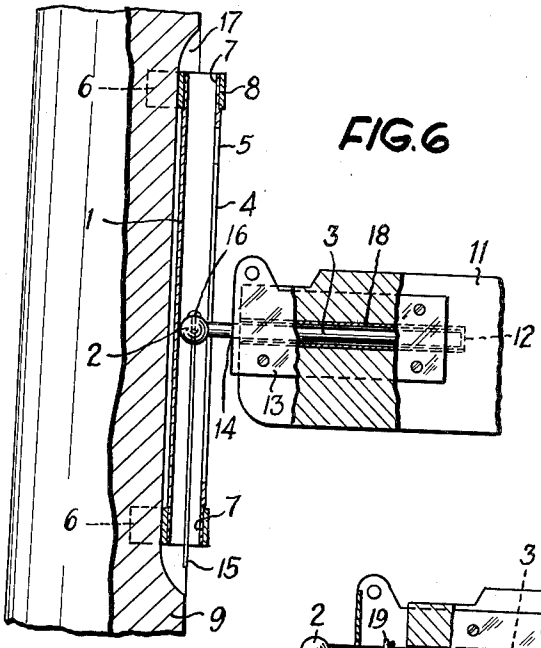


FIG.6

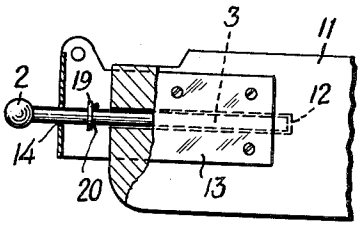


FIG.7

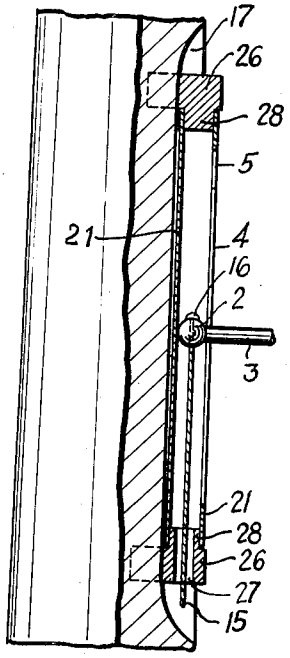


FIG.8

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CONNECTING DEVICE FOR ATTACHING BOOMS TO MASTS

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Claims priority, application Sweden March 20, 1950

6 Claims. (Cl. 114—98)

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This invention relates to a jointed connecting device, suitable for sailing boats, for attaching the boom to the mast. Heretofore, usually hinge structures have been utilized for this purpose, said hinge structures having double joints in order to enable swinging in both a horizontal and a vertical direction. These known joint structures have the disadvantage that they are comparatively bulky, the result being an unfavourable gap between the mast and the fore leech rope. Moreover, the movability of such joints often is more restricted than desirable.

The object of this invention is to provide an improved connecting device, by means of which the aforesaid disadvantages are reduced and which further has the advantage of affording a lighter and cheaper structure.

The invention will be more fully described hereinafter with reference to the accompanying drawings, showing, by way of example, a favourable embodiment of the invention.

Fig. 1 shows a part of a mast, viewed from aft, provided with a connecting device according to the invention.

Fig. 2 shows a cross-section, taken along line II—II of Fig. 1, of said mast portion and connecting device.

Fig. 3 shows an end-view of a mounting member for securing the connecting device to the mast.

Fig. 4 shows the fore end portion of a boom.

Fig. 5 is a left-hand end view of Figure 4.

Fig. 6 is a longitudinal central view through the mast shown in Figure 1.

Fig. 7 is a detailed view of a stop device associated with the mast assembly; and

Fig. 8 is a longitudinal sectional elevation of a modified form of the invention.

With reference to Fig. 1, the connecting device comprises a hollow bar or a tube 1 which may, for instance, be made of galvanized iron, metal or stainless material. A ball 2, having such a diameter that it can, easily though without undue play, slide up and down in the tube, is attached to the end of a pin 3. Most conveniently the ball 2 and the pin 3 are formed integrally in one piece. After inserting the ball 2 in the tube 1 the pin 3 is allowed to extend through a slit or elongated guide slot 4 provided in tube 1. Said slit accommodates pin 3 so that the pin can extend freely though without unnecessary play.

The tube 1 is attached to the mast 9 along its adjacent end portions by means of two spaced mounting members 6, Fig. 3 showing one such

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member separately in an end-view. For fixing the tube 1 in axial direction the end portions 7 of tube 1 are turned down to a reduced outer diameter. The turned down portions 7 have a slidable fit in sockets or bushes 8 formed out of the mounting members 6 (Fig. 2). The mounting members 6 are attached to the mast 9 by means of screws 10.

The ball-joint pin 3 is adapted to be inserted into a longitudinal bore 12 provided in the end of the boom 11, as shown in Fig. 4. Preferably the edge of said bore should be reinforced, and as shown, the end mounting 13 provided for attaching the leech rope may conveniently at the same time be utilized for such reinforcing purpose. Said end mounting is U-shaped and provided with an aperture forming a rigid edge 14 at the outer end of bore 12. The mounting 13 is provided with spaced lugs having aligned openings 11' for receiving a suitable retaining member, such as a pin or the like.

Conventionally a stretching tackle is used for stretching the mast fore leech rope. In the device shown the streching wire 15 conveniently is attached to the joint-ball 2 in any suitable manner. In the embodiment shown the wire 15 (Fig. 1) is drawn through a bore provided in the ball and anchored in it as indicated at 16. The free part of the wire extends through the lower end of tube 1.

The boom 11 is free to rise and fall as desired, since the joint-ball 2 is free to slide upwards and downwards in the guide tube 1. By virtue of the slit 4 the boom is not hampered in swinging in a vertical direction, and its liberal ability of swinging in a horizontal direction is ensured by the tube 1 being free to rotate in bushes 8. The boom is freely pivotal on the pin 3, which is advantageous since the stretching wire 15 prevents the ball 2 from free rotation round the longitudinal axis of the boom. The connection device described is of a simple and robust structure, saving weight and costs.

In order to make the gap between the sail and the mast as small as possible, the tube 1 conveniently should be mounted in a manner so as to protrude in the least possible degree from the contour of the mast. For this object the tube 1 is received in a longitudinal recess 17 provided in the mast. For this purpose the mounting members 6, being curved in accommodation to the circumference of the mast, are shaped such that their socket portions 8 are sunk inwards, that means towards their concave side. This arrangement will be evident from Fig. 2.

In addition to the above mentioned reinforcement 14, the bore 12 provided in the boom conveniently may be reinforced, as will be evident from Figure 6, by means of a tubular lining or sleeve 18 inserted in the bore, in order to prevent wear of the walls of said bore due to the joint pin 3 rotating in the bore 12.

The pin 3 is freely rotatable and also freely axially slidable in the bore 12, which is considered to be favorable. Generally there is no risk of the pin 3 sliding entirely out of the bore 12 since, with regard to the forces acting on the boom, such large aftwards movements of the boom are unusual. In order, however, positively to prevent the pin 3 from separating from the boom, said pin may be provided with a stop member of an arbitrary kind. Such stop member may be constructed as shown, by way of example, in Figure 7. In this figure, the boom mounting 13 is extended to some amount in a direction fore of the boom so as to leave a space between the yoke portion of the mounting 13 and the end of the boom 11. Within said space a stop ring 19 is slipped on to the pin 3, said stop ring being secured by means of a key 20 or the like. Various other kinds of stop devices may be used alternatively.

Alternatively the joint-ball 3 may be permanently secured to the end of the boom; for instance, the ball may be attached to the boom mounting 13, or said two parts may be made in one integral piece and by means of a neck portion formed between the ball portion and the rest of the mounting the ball portion can penetrate through the slit 4. In the latter case the slit 4 should be provided with a circular distension or key-hole slot 5, in order to enable inserting the ball into the tube 1 and removing the ball from the tube. With the embodiment previously described, such distension 5 is not required, since the ball 2 together with the pin 3 may be inserted through one end of the tube.

The pivotal mounting of the tubular member represented in Figures 1 and 6 by tube 1 may be modified in several alternative manners without departing from the scope of the invention. By way of example, Figure 8 shows a possible modification of pivoting the tubular member. According to Figure 8, two connecting members 26 replace members 6 shown in Figures 1–6 and are provided with journals or trunnions 28 fitting into the open ends of a tube 21. This tube 21 is provided with a slot 4 which also may have an enlarged end 5, and is adapted to receive a ball 2 and pin 3, in a similar manner as tube 1 of Figures 1 and 6. The lower trunnion 28 may be provided with a bore 27 permitting the previously mentioned sail stretching wire 15 to pass downwardly therethrough. The aperture 11' in the boom mounting 13 is arranged to receive any suitable guide wire or the like.

According to an alternative embodiment the joint-ball is fitted into a cup-shaped ballholder, which is provided with two trunnions lying in flush with each other and extending in opposite directions from said ballholder, each of said trunnions being journalled in a mounting member of the same kind as the member 6 above described. These trunnions preferably should be journalled so as to be longitudinally movable, and they should have ample length, in order to obtain the above-mentioned longitudinal movability along the mast. In this embodiment the stretching wire 15 may be attached to the lower end of the lower trunnion instead of being attached to the ball.

What I claim is:

1. In combination with a boom, a mast, means for connecting the mast to the boom, said means including a tubular member having an elongated slot and extending longitudinally of the mast, means rotatably connecting the tubular member to the mast about a longitudinal axis, movable means axially slidable in said tubular member and having an arm extended outwardly therefrom and through said slot, said movable means rotatable about an axis transverse to said tubular member and to said arm, and means for connecting the boom to said arm.

2. A connecting device as called for in claim 1 in which the boom is provided with a bore extending inwardly from one side thereof, and a lining sleeve is mounted in said bore and arranged to detachably receive said pin.

3. A connecting device as called for in claim 1, in which the ends of the tubular member have reduced external diameters, and spaced means rotatably connecting the tubular member to the mast, said spaced connecting means being provided with sockets for receiving said ends.

4. A device as called for in claim 1, in which said movable means is in the form of a ball, said arm is in the form of a pin, and means are provided for pivotally connecting said boom to said pin.

5. A device as called for in claim 1, in which said movable means is in the form of a ball, said arm is in the form of a pin, and said boom is provided with a bore extending inwardly from one side thereof arranged to loosely receive said pin so as to be rotatably supported thereby.

6. A connecting device as called for in claim 1, in which spaced means rotatably connecting the tubular member to the mast are provided, and said spaced means each includes a mounting member having a trunnion for fitting axially into said tubular member.

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